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MRSA Breast Abscesses in Postpartum Women

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BACKGROUND: Infections caused by community-acquired methicillin-resistant *Staphylococcus aureus* (CA-MRSA) are being increasingly observed in patients who lack traditional risk factors. While mastitis and breast abscesses are commonly encountered in post-natal women, CA-MRSA breast infections have rarely been reported.

MATERIALS AND METHODS: We reviewed 15 postpartum women with methicillin-resistant *Staphylococcus aureus* (MRSA) breast abscesses observed in our unit from June 2005 to April 2007. Ultrasonographic examination was performed in all cases. MRSA infection was diagnosed on microbiological analysis cultured from the abscesses of these patients.

RESULTS: The median age of the patients was 31.5 years. The majority of the patients were primiparae (80%). Only one patient was immunocompromised. None of the patients had history of previous breast infection and none developed recurrence. Eleven patients (73.3%) underwent aspiration of pus and four patients (26.7%) underwent incision and drainage. All the cultures were sensitive to co-trimoxazole and vancomycin. Eight (53.3%) of the cultures were also sensitive to erythromycin.

CONCLUSION: CA-MRSA is an emerging problem in our obstetric population. CA-MRSA breast infections are clinically responsive to common oral antibiotics such as co-trimoxazole and erythromycin. A high index of suspicion is essential to avoid delay in the clinical response to empirical beta-lactams as these patients may benefit from an early change of antibiotics. [*Asian J Surg* 2009;32(1):55–8]

Key Words: community-acquired MRSA, breast abscesses, postpartum

Introduction

Mastitis is a common problem in postpartum women, especially those who are breastfeeding. It occurs within 6 weeks of delivery with reported rates ranging from 1% to 33%.[1] About 4.6% to 11% of these women with mastitis progressed to abscess formation if treatment is delayed.[2,3]

The bacteria involved are usually *Staphylococcus aureus*, coagulase negative staphylococci and anaerobes.[4] However, cases of breast infections secondary to community-acquired methicillin-resistant *Staphylococcus aureus* (CA-MRSA) have been increasingly reported among postpartum women who lack traditional risk factors.[1,5,6] MRSA is known to be associated with prolonged hospital care and indwelling medical devices and hence an unlikely pathogen for such community-acquired infections. These breast infections respond poorly to the usual beta-lactams and frequently present as abscesses due to delay in appropriate treatment. This results in significant morbidity and interferes with continued breastfeeding.

Mastitis and breast abscesses caused by MRSA have rarely been described. Our study describes the presentation and outcome of MRSA breast infections in 15 postpartum women treated at our unit and aims to review the current literature surrounding this infection.

Methods

The medical records of post-natal nursing women who were diagnosed with MRSA breast abscesses at KK Women's

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and Children's Hospital during the period June 2005 to April 2007 were reviewed. The data was retrieved from the departmental computerised database after seeking approval from the KK Hospital Institutional Review Board.

Ultrasonographic examination was performed in all cases. Breast abscess was diagnosed as a fluctuant mass in addition to inflammatory findings. This was confirmed by bedside ultrasound examination as an anechoic collection containing low level internal echoes surrounded by an echogenic rim. All patients were given 625 mg amoxicillin/clavilunate orally and twice daily for 1 week (or 500 mg ciprofloxacin twice daily in one case with a penicillin allergy) as empirical treatment after obtaining pus cultures. Aspiration was performed at the bedside with a 16-gauge needle. When successful at first attempt, aspiration was performed every 2–3 days until the breast was clear of any collection on ultrasound. If aspiration was hampered by thick viscid pus and multiple loculations within the abscess cavity; or the patient refused percutaneous aspiration; surgical drainage was performed on the same day. The sample of pus obtained was sent for bacteriological examination. All patients were treated on an outpatient basis and followed up until clinical and sonographic resolution of abscesses.

The following parameters were recorded: patient age, parity, comorbid conditions, prior history of breast infections, duration of lactation, duration of symptoms, side of affected breast, abscess diameter, treatment details including types of antibiotics prescribed, pus culture results, method of drainage, number of aspiration attempts, time to clinical resolution and recurrence.

Results

A total of 15 cases of MRSA breast abscesses were studied during the period of review (Table). The median age of the patients was 31 (range, 24–38) years. The majority of patients (80%) were primiparae and there was no predilection of laterality of breast involvement with the right breast affected in 8 (53.3%) patients and the left breast in 7 (46.7%) patients. The median duration of follow-up was 9 months (range, 1–26 months).

One patient had systemic lupus erythematosus on immunosuppressants and one other patient had mild gestational diabetes. The rest of the patients had no significant comorbidities. None of the patients had previous breast abscesses or demonstrated recurrence during the period of follow-up. Our patients developed the abscesses at a median of 5 weeks (range, 3–16 weeks) postpartum. The duration of symptoms prior to consultation with a breast specialist ranged from 5 to 31 days (median, 14 days). The median size of the abscesses was 4.3 cm (range, 2.0–10.0 cm). Histology was documented for 5 (33.3%) of the cases and none showed malignancy.

Table. Characteristics of patients studied

Patient	Date of presentation	Age (yr)	Parity	Post-delivery (wk)	Duration of symptoms (d)	Side of abscess	Abscess size (cm)	Method of drainage	Number of aspirations
1	27/6/05	33	2	12	7	Right	5.0	I&D	NA
2	18/9/05	31	1	8	7	Right	4.0	I&D	NA
3	9/12/05	30	2	5	5	Left	6.0	Asp	3
4	12/4/06	24	1	3	14	Left	10.0	I&D	NA
5	11/7/06	34	1	12	21	Left	5.0	I&D	NA
6	12/7/06	29	1	4	14	Right	2.5	Asp	1
7	12/12/06	33	1	3	14	Right	5.0	Asp	3
8	7/12/06	30	1	12	11	Left	4.0	Asp	3
9	5/1/07	31	1	9	14	Right	4.3	Asp	3
10	7/2/07	31	1	5	14	Left	3.4	Asp	3
11	12/2/07	38	2	8	14	Left	4.0	Asp	2
12	12/3/07	38	1	8	14	Right	10.0	Asp	2
13	30/3/07	32	1	4	14	Left	2.5	Asp	1
14	3/4/07	34	1	4	7	Right	2.0	Asp	1
15	10/8/07	29	1	3	7	Right	8.0	Asp	3

I&D = incision and drainage; Asp = percutaneous aspiration; NA = not applicable.

Twelve patients (80%) were treated with only amoxicillin/clavilunate before culture results were available. One patient had both amoxicillin/clavilunate and cloxacillin for 1 week. One patient had amoxicillin/clavilunate for 4 days and ciprofloxacin for 2 days, and one patient was given only ciprofloxacin due to a penicillin allergy. A change of antibiotics to co-trimoxazole was instituted in 9 patients (60%) according to bacteriological culture and sensitivity once results were available. The overall median duration of antibiotics was 14 days (range, 7–26 days). All the cultures of MRSA were sensitive to co-trimoxazole and vancomycin. Eight (53.3%) of the cultures were also sensitive to erythromycin.

The majority of our patients (73.3%) were treated with aspiration. More than half of these patients (54.5%) required aspiration on more than two consecutive visits. The resulting success rate of percutaneous aspiration without resorting to surgical drainage was 100%. The median time to complete clinical resolution in this group was 16 days (range, 5–28 days). In contrast, this period for the patients who underwent surgical drainage was 21 days (range, 5–28 days). There were no recurrences observed during follow-up.

Discussion

Reports of postpartum MRSA infections among young, immunocompetent women lacking traditional risk factors for MRSA have surfaced in the past few years.[1,5,6] Isolates in these cases of CA-MRSA are susceptible to multiple non-beta-lactam antibiotics and possess distinct molecular features.[7] In our institution, MRSA breast abscesses appear to be an emerging problem. We considered CA-MRSA as the causative agent because the isolates in our study were unusually susceptible to non-beta-lactam antibiotics.

Multisusceptible MRSA is not new in Singapore.[8] Analysis of hospital-acquired MRSA strains isolated from two tertiary public hospitals in Singapore in 2004 observed a progressive increase in the number of cases since 2002 and that multisusceptible strains were gradually replacing the endemic multiresistant strain (ST239-MRSA-III). Molecular typing confirmed a predominant clonal outbreak of a UK-EMRSA-15 strain.[9] A recent update involving all the tertiary public hospitals in Singapore showed a rapidly increasing spread of the EMRSA-15 clone from MRSA isolates, replacing the endemic ST239 clone island-wide by the first half of 2006.[9] EMRSA-15 emerged as a significant nosocomial pathogen in the United Kingdom in 1991 and is at present one of the two predominant health-care-associated MRSA (HA-MRSA) clones in the country, having replaced most of the other HA-MRSA clones in the first decade of its emergence.[11] Typing of the isolates in our study will be helpful to determine if they are of the same strain as EMRSA-15.

In contrast to hospital-acquired MRSA, CA-MRSA possess differing virulence genetic profiles and cause a distinct spectrum of infections in the young and immunocompetent who lack traditional risk factors for MRSA infections. While the majority of CA-MRSA breast abscesses are generally susceptible to most non-beta-lactam antibiotics, resistance to various older non-beta-lactam antibiotics may be relatively easily acquired. Widespread use of clindamycin had resulted in a small but significant rise in resistance within 2 years in northeast USA.[12] Pus culture sensitivity results confirmed the multisusceptibility nature of the strain of MRSA in our study. Although all the isolates were sensitive to vancomycin, none of our patients presented with signs of systemic septicaemia hence routine admission for intravenous vancomycin was not deemed necessary. However, it remains important that patients with MRSA infections should be evaluated based on their culture sensitivity results and treated accordingly. Serial follow-up to ensure resolution is also important to prevent sub optimal treatment and recurrence. Interestingly, in about 40% of cases in the current study, the infection resolved with surgical management and empiric antibiotics to which the isolate was later found to be resistant. This was not influenced by the method of drainage as 50% of these patients underwent surgical drainage and the rest underwent percutaneous aspiration. This supports an observation from a recent study that up to 30% of MRSA soft tissue infections recovered uneventfully after surgical drainage, even when treated with antibiotics that were ineffective based on culture sensitivity results.[13] This remains a controversial point and well-designed clinical trials are needed before antimicrobials may be routinely omitted as part of treatment. However, it is noteworthy that our study has shown that surgical drainage may not necessarily be more advantageous over less invasive drainage procedures even in the management of MRSA infections.

In our study, all the patients achieved clinical resolution within a median of 16 days (range, 5–28 days) on outpatient treatment with oral antibiotics and aspiration or

surgical drainage of the abscesses. This is comparable to studies on non-MRSA lactational breast abscesses.[2,14] In our cohort of 15 patients, the majority (73.3%) were treated by aspiration of pus. While incision and drainage have been recommended by several authors over percutaneous aspiration for abscesses larger than 5 cm^2, we did not adopt such a size criterion for our practice. We believe that we managed to achieve high success rates in percutaneous aspiration of abscesses because of routine bedside ultrasonography for all patients. This practice not only helped with diagnosis and selection of patients for either method of drainage; but also helped guide needle placement for cases that underwent percutaneous aspiration.

All the patients in our study presented with delivery dates that spanned more than 9 months without overlap, suggesting that MRSA was independently acquired rather than outbreak-related. Previous authors have observed a predilection for such infections in multiparous women, involvement of multiple sites and recurrent infections.[5] We did not observe such a trend in our patients as the majority of our patients are primiparous (78.6%) and none had recurrence or involvement of more than one site. This could be explained by the high incidence of comorbid conditions (33%) in their cohort compared to our study (6.7%). Also, previous authors have demonstrated the benefits of breast emptying and reinforcement of nursing techniques in the process of treating lactational breast abscesses.[15,16] Milk stasis due to insufficient nursing techniques has been proposed as an excellent culture media for microorganisms. It is therefore no surprise that the majority of our patients are primiparae.

It is important to recognise that the remarkable success in dissemination of EMRSA-15 in our community within 4 years since its entry highlights the lack of control over the spread of this clone. While there are clearly short-term advantages in having multisusceptible MRSA replace the multiresistant strains, including more antimicrobial options for treating such infections, standard contact precautions and proper hand hygiene cannot be overemphasised. Proper decontamination is mandatory for breast pumps and accessories.

The emergence of CA-MRSA infection is set to alter healthcare practices in our communities. The prevalence in our population is still not known and additional studies are needed. However, the medical community needs to be aware of the current trend. Empirical treatment of community-acquired mastitis with beta-lactam agents without culturing specimens obtained from the infected site may no longer be appropriate. Active surveillance for CA-MRSA infections and colonisation and molecular studies of virulence factors are critical to a complete understanding of the epidemiology of this emerging pathogen.

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